PATENT
Customer Number 22,852
Attorney Docket No. 7040.0113.00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Renato CARETTA	)	
	)	
Serial No.: Not yet assigned	)	Group Art Unit: Not yet assigned
	)	
Filed: December 26, 2001	)	Examiner: Not yet assigned
	)	
For: METHOD AND APPARATUS FOR MOULDING AND CURING TYRES FOR VEHICLE WHEELS	)	

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above-captioned application, please amend this application as follows:

IN THE SPECIFICATION:

Please amend the specification, as follows:

Add two section headings, a section subheading, and a paragraph immediately after the title METHOD AND APPARATUS FOR MOULDING AND CURING TYRES FOR VEHICLE WHEELS, as follows:

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--CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application of International Application No. PCT/EP00/05389, filed June 13, 2000, in the European Patent Office, the contents of which are relied upon and incorporated herein by reference; additionally, Applicant claims the right of priority under 35 U.S.C. § 119(a) - (d) based on patent application No. 99830405.9, filed June 25, 1999, in the European Patent Office; further, Applicant claims the benefit under 35 U.S.C. § 119(e) based on prior-filed, copending provisional application No. 60/147,027, filed August 3, 1999, in the U.S. Patent and Trademark Office.

BACKGROUND OF THE INVENTION

Field of the Invention--

Page 1, line 31, add section subheading --Description of the Related Art-- prior to the start of the paragraph beginning "In a tyre production cycle . . . ."

Page 6, line 1, add section heading --SUMMARY OF THE INVENTION-- prior to the start of the paragraph beginning "In accordance with the present invention . . . ."

Page 11, line 16, add section heading --BRIEF DESCRIPTION OF THE DRAWINGS-- prior to the start of the paragraph beginning "Further features and advantages . . . ."

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Page 12, line 6, add section heading --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS-- prior to the start of the paragraph beginning "With reference to said drawings . . . ."

Add a new page 33 after the claims, adding the following ABSTRACT OF THE DISCLOSURE. A new, separate page 33 including the ABSTRACT OF THE DISCLOSURE is enclosed.

--ABSTRACT OF THE DISCLOSURE

A method of moulding and curing tyres for vehicle wheels includes the steps of disposing a tyre being processed on a toroidal support, enclosing the tyre and the toroidal support inside a moulding cavity defined in a vulcanization mould, pressing the outer surface of the tyre against the moulding cavity walls, and administering heat to the tyre to cause molecular crosslinking of the tyre. The pressing step includes the steps of compressing side portions of the tyre between the moulding cavity walls and the outer surface of the toroidal support, concurrently with the closing step, and imposing an expansion to a radially-outer portion of the tyre to bring the radially-outer portion of the tyre against the walls of the moulding cavity.--

IN THE CLAIMS:

Please cancel, without prejudice or disclaimer, claims 2-33, and add new claims 34-66, as follows:

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--34. (new) A method of moulding and curing tyres for vehicle wheels, comprising the steps of:

disposing a tyre being processed on a toroidal support, wherein an outer surface of the toroidal support substantially mates with an inner surface of the tyre;

enclosing the tyre and the toroidal support inside a moulding cavity defined in a vulcanization mould, the moulding cavity having walls, wherein a shape of the moulding cavity walls matches an outer surface of the tyre when vulcanization is completed;

pressing the outer surface of the tyre against the moulding cavity walls; and

administering heat to the tyre to cause molecular crosslinking of the tyre;

wherein the pressing step comprises the steps of:

compressing side portions of the tyre between the moulding cavity walls and the outer surface of the toroidal support, concurrently with the closing step, wherein the side portions extend from inner circumferential edges of the tyre to transition regions between sidewalls, located at respective side portions, and a tread band disposed at a radially-outer portion of the tyre, delimited between the side portions; and

imposing an expansion to a radially-outer portion of the tyre, delimited between the side portions, to bring the radially-outer portion of the tyre against the walls of the moulding cavity.

35. (new) The method of claim 34, wherein tyre expansion is carried out by admitting a fluid under pressure to at least one diffusion interspace created between the outer surface of the toroidal support and the inner surface of the tyre.

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36. (new) The method of claim 35, wherein, before admission of the fluid under pressure, the inner surface of the tyre substantially adheres, over a whole extension of the inner surface of the tyre, to the outer surface of the toroidal support, and wherein the diffusion interspace is created during tyre expansion.

37. (new) The method of claim 34, wherein admission of the fluid under pressure takes place through feeding channels formed in the toroidal support and opening onto the outer surface of the toroidal support.

38. (new) The method of claim 35, wherein, before the pressing step, a preforming step is carried out by admission of a working fluid between the outer surface of the toroidal support and the inner surface of the tyre, and wherein the working fluid is under a lower pressure than that of the fluid under pressure admitted during the pressing step.

39. (new) The method of claim 35, wherein heat administration takes place by admission of a heating fluid to the diffusion interspace, and wherein the heating fluid comprises a same fluid under pressure as employed for carrying out the pressing step.

40. (new) The method of claim 35, wherein the fluid under pressure is introduced into an upper portion of the moulding cavity and guided along an inner surface of the toroidal support towards a lower portion of the moulding cavity.

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41. (new) The method of claim 40, further comprising a step of drawing the fluid under pressure out of the lower portion of the moulding cavity, carried out concurrently with introducing the fluid under pressure, to create a pressurized fluid stream along the inner surface of the toroidal support and the diffusion interspace.

42. (new) The method of claim 40, wherein a rotational movement around a geometric axis of the toroidal support is imparted to the fluid under pressure introduced into the moulding cavity.

43. (new) The method of claim 35, wherein the diffusion interspace has an extension between 3 mm and 14 mm, measured between the inner surface of the tyre and the outer surface of the toroidal support, at least at an equatorial plane of the tyre.

44. (new) The method of claim 34, wherein the expansion involves an increase in the tyre circumference between 1% and 3.5%, measured at an equatorial plane of the tyre.

45. (new) The method of claim 34, wherein the step of disposing the tyre on the toroidal support is carried out by directly manufacturing the tyre on the toroidal support.

46. (new) The method of claim 35, wherein, before admission of the fluid under pressure, a treatment of the inner surface of the tyre is carried out to prevent permeation of the fluid under pressure through an elastomer material forming the tyre.

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47. (new) The method of claim 35, wherein a prevulcanized liner is directly formed on the toroidal support during a preliminary step to prevent permeation of the fluid under pressure through an elastomer material forming the tyre.

48. (new) An apparatus for moulding and curing tyres for vehicle wheels, comprising:

a toroidal support arranged to engage a tyre being processed, the toroidal support having an outer surface substantially mating with an inner surface of the tyre;

a vulcanization mould arranged to receive the toroidal support carrying the tyre within a moulding cavity having a holding space delimited between the outer surface of the toroidal support and walls of the moulding cavity;

pressing devices for pressing an outer surface of the tyre against the walls of the moulding cavity; and

heating devices for transmitting heat to the tyre enclosed in the moulding cavity;

wherein, under a closed condition of the vulcanization mould, the holding space has radially-inner portions and a radially-outer portion, wherein the radially-inner portions have shapes and sizes substantially corresponding to shapes and sizes of respective side portions of the tyre, and wherein the radially-outer portion has radial dimensions greater than radial dimensions of a radially-outer portion of the tyre.

49. (new) The apparatus of claim 48, wherein the pressing devices comprise channels for feeding fluid under pressure which are formed through the toroidal support and open onto the outer surface of the toroidal support.

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50. (new) The apparatus of claim 48, wherein, when the vulcanization mould is closed, the holding space has a greater volume than a volume taken up by the tyre.

51. (new) The apparatus of claim 49, wherein the feeding channels open into at least one interspace for diffusion of the fluid under pressure, defined in a radially-outer portion of the holding space, between the outer surface of the toroidal support and the inner surface of the tyre.

52. (new) The apparatus of claim 48, wherein the outer surface of the toroidal support has an extension less than an extension of the inner surface of the tyre after vulcanization is completed.

53. (new) The apparatus of claim 49, further comprising at least one guide duct for the fluid under pressure extending along an inner surface of the toroidal support and terminating at the feeding channels.

54. (new) The apparatus of claim 53, wherein the at least one guide duct is confined between the inner surface of the toroidal support and a filling structure fastened to the inside of the toroidal support.

55. (new) The apparatus of claim 54, wherein the filling structure has an outer surface substantially extending parallel to the inner surface of the toroidal support.

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56. (new) The apparatus of claim 54, wherein the filling structure comprises an upper portion having an outer surface substantially parallel to the inner surface of the toroidal support, and a lower portion having a base surface with an inclined orientation relative to a horizontal plane.

57. (new) The apparatus of claim 53, wherein the pressing devices comprise circumferentially-distributed admission nozzles oriented toward an end of the at least one guide duct.

58. (new) The apparatus of claim 57, wherein the admission nozzles are oriented toward an inlet end of the at least one guide duct disposed above an equatorial plane of the toroidal support.

59. (new) The apparatus of claim 57, wherein the admission nozzles have an inclined orientation relative to a direction radial to a geometric axis of the toroidal support.

60. (new) The apparatus of claim 49, comprising at least a first and a second series of the feeding channels, located at respectively opposite positions relative to an equatorial median plane of the toroidal support and oriented toward directions respectively converging away from a geometric axis of the toroidal support.

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61. (new) The apparatus of claim 48, wherein the toroidal support has at least one centering shank for engagement in a centering seating associated with the vulcanization mould for fixing positioning of the toroidal support and the tyre in the moulding cavity.

62. (new) The apparatus of claim 61, wherein the centering shank extends along a geometric axis common to the toroidal support, to the tyre, and to the moulding cavity.

63. (new) The apparatus of claim 49, wherein the heating devices preferably comprise at least one duct to send a heating fluid to the feeding channels.

64. (new) The apparatus of claim 63, wherein the heating fluid comprises a same fluid as the fluid under pressure.

65. (new) The apparatus of claim 48, wherein the toroidal support has a structure elastically yielding in an axial direction, at least at regions corresponding to inner circumferential edges of the tyre.

66. (new) The apparatus of claim 48, wherein the toroidal support has a structure elastically yielding in an axial direction, at least at regions corresponding to the side portions of the tyre.--

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REMARKS

Applicant submits this Preliminary Amendment together with a patent application under 37 C.F.R. § 1.53(b).

In this Preliminary Amendment, Applicant adds section headings, section subheadings, and an Abstract of the Disclosure to conform to U.S. practice. Additionally, Applicant adds claims to the right of priority and benefit. Further, Applicant cancels, without prejudice or disclaimer, claims 2-33, and adds new claims 34-66, which include the same subject matter as the original claims, to improve clarity. The originally-filed specification, claims, abstract, and drawings fully support the amendments to the specification and the addition of new claims 34-66. No new matter was introduced.

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: December 26, 2001

By:_____
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